

TWO CASES OF RUPTURE OF THE BLADDER.

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WITHIN recent years valuable papers have been published on intraperitoneal rupture of the bladder, notably by Alexander and Jones in *THE ANNALS OF SURGERY*, and from a review of the published cases some definite conclusions have been arrived at as regards the mechanism, clinical features and results of treatment of this rare accident. Since MacCormac, in 1886, published the first two cases successfully operated upon quite a number have been put on record and it is now quite clear that the prognosis with the advance of surgical technique is becoming more and more favorable. Thus, Jones in the fifty-four cases collected by him showed that the death-rate was forty-eight per cent. but that twenty-two of these fifty-four cases occurred during the last ten years and in them the mortality was only twenty-seven and a half per cent. This is all the more striking a tribute to surgical progress when it is borne in mind that the average time between the accident and the operation was longer in them than in those occurring previous to ten years ago. Two cases of rupture of the bladder have come within my experience and it has been thought desirable to add these to the few recorded since the publication of the papers mentioned above.

CASE I.—*Intra-peritoneal and Extra-peritoneal Rupture of the Bladder—Suture—Recovery.*—J. M., fifty-two years of age, by occupation a shipwright, was admitted to the Royal Infirmary, Aberdeen, on the 10th March, 1903, with the following history: At 1 P.M. on the previous day while ascending stairs he fell and struck the lower part of his abdomen on the edge of one of the steps. His complaint was that from the time of his accident he

had had pain over the region of his bladder and inability to pass urine. There was no sign of external bruising but the lower part of the abdomen was somewhat distended especially in the median line and on percussion the whole lower abdomen from about one inch below the umbilicus was dull as also were the flanks. Dr. Robertson, my house surgeon, passed a catheter without meeting any obstruction and drew off about three ounces of apparently normal urine, followed by a few drops of blood. As no relief was experienced the patient was once more catheterised, but this time no urine came away at all and as the pain and desire to micturate were still complained of and no difference was to be detected in the percussion dulness already referred to he was put to bed. Catheterisation after a lapse of two hours again brought away about two ounces of urine, followed by some blood. Dr. Robertson then resolved to try the injection test, and accordingly 13½ ounces of warm boracic lotion were run into the bladder by catheter, tube and funnel under strict antiseptic precautions and only four ounces could be withdrawn subsequently. Patient's temperature was 98° and his pulse was 96, occasionally slightly irregular but of good volume. He had no appearance of collapse or shock. A diagnosis of intraperitoneal rupture of the bladder was made and I was sent for with a view to operation.

Operation at 1.25 P. M., rather over twenty-four hours after the accident. An incision was made in the median line from the pubes upwards and the prevesical space opened first. From this region some blood-stained urine escaped from a small irregular tear just behind the pubes. Through the peritoneum fluid could be felt in the peritoneal cavity, which was accordingly opened and a large amount of blood-stained liquid escaped. With the exception of slight congestion of the intestines at the lower part of the abdomen there was no trace of peritonitis. The peritoneal cavity was mopped clean and an examination of the bladder instituted, when a small tear was found in the median line just behind the peritoneal reflection. The rupture of the viscus extended from just behind the pubes along the top to a point behind the peritoneal reflection referred to. This rupture had not penetrated the whole thickness of the bladder wall except at its two extremities. The extraperitoneal rupture behind the pubes was with great difficulty surrounded by a purse-string suture which was

then buried by a series of interrupted Lembert sutures. The intraperitoneal rupture was closed by a double row of Lembert sutures without difficulty. The abdominal cavity was thereafter mopped dry and after flushing copiously with sterile salt solution the peritoneum was completely closed as was also the rest of the abdominal wound except at the lower part where tube and gauze drainage leading down to the extraperitoneal rupture was employed. A soft rubber catheter was introduced per urethram into the bladder and tied in.

About 15 ounces of urine were passed by catheter during the rest of the day, but some came by drainage through the lower angle of the abdominal wound. The following day less came by catheter and more suprapubically, as his catheter was frequently found partially withdrawn from the bladder. In the evening his temperature rose to 101°F. and the patient began to show signs of delirium tremens. After a very restless night his temperature came down almost to normal and during the following day 35 ounces of urine came by catheter and very little suprapubically. This went on, sometimes a good deal coming by catheter and less the other way and *vice versa*, when it was discovered that the patient had been attempting at intervals to remove the instrument from his bladder from a few hours after the operation and eventually on the fourth day, he succeeded in extracting it altogether and absolutely refused to have it replaced. His restlessness and delirium never became violent and in five or six days disappeared. The subsequent history is that the suprapubic wound gradually closed and in ten days all his urine was passed per urethram. He was discharged well exactly a month after operation.

About this case there are many points of interest, but the chief are: In the first place, the extraperitoneal and intraperitoneal ruptures were not distinct and separate from each other but were simply the extremities of a median rupture in the vault of the bladder which had not in the rest of its course completely penetrated all the coats. Then, again, in dealing with an intraperitoneal wound of the bladder the safest practice after suturing is undoubtedly to pass a drain for a few days down to the neighborhood of the suture, but

here the circumstances were exceptional. I felt I could count almost to a certainty on the sutures of the intraperitoneal wound holding, but could not do so in the case of those of the extraperitoneal wound on account of the difficulty I had in getting them placed behind the pubes. Leakage from the latter, had intraperitoneal drainage been employed, would probably have infected the former and ended in disaster. The subsequent behavior of the patient in withdrawing the eye of the catheter from his bladder leading to distention of that viscus and leakage from the suprapubic wound proved the wisdom of the procedure adopted. The absence of peritonitis is noteworthy and once more explodes the old idea that peritonitis is set up as soon as urine escapes into the peritoneal cavity. In this case it was evidently due to the aseptic condition of his urine.

CASE II.—*Extraperitoneal Rupture of the Bladder and Hydatid Cyst of the Abdomen—Operation—Recovery.*—Mrs. M., forty-one years of age, was admitted to the Royal Infirmary, Aberdeen, on the 18th March, 1904, at 11.45 P.M. She stated that at 9 A.M. on the previous day she had fallen a height of ten feet, alighting on the left side of her pelvis and back and that since that time she had had continuous pelvic pain with frequent desire to urinate and the passage of very small quantities of blood-stained urine. She looked flushed and feverish, her temperature being 100°F; pulse of fair quality, 104, and respirations 20. On account of the pelvic pain she was unable to turn on her side. Her abdomen was moderately distended and did not participate in the respiratory movements. There was general tenderness with loss of resonance in the flanks and bladder region and tympanitic note elsewhere, while the liver dullness was completely abolished. Tapping the iliac crests produced slight crepitus and aggravated the pelvic pain. No abnormality could be made out on vaginal and rectal examination. Catheterisation of the bladder brought away eleven ounces of dark blood-stained urine and on trying the injection test the full quantity was recovered. About an hour after admission she vomited some bilious material.

It was evident from the condition of the abdomen that an intraperitoneal injury had occurred, but the exact nature of it I

could not determine. While extraperitoneal rupture of the bladder was thought probable, an intraperitoneal rupture, although not absolutely negated by the injection test, was rendered less likely.

Operation 2 A.M. on the 19th March, forty-one hours after the accident. The prevesical space was first explored but no sign of rupture could be made out, and accordingly the peritoneal cavity was opened. After mopping out a quantity of blood-stained fluid a careful but fruitless search was instituted for injury to any of the contained viscera. The frequency of micturition with the passage of very small quantities of blood-stained urine pointed to a bladder injury, and in case a small intraperitoneal rupture had escaped observation I caused the organ to be distended with warm boracic lotion. It was then seen that the rupture was extraperitoneal, the injected fluid coming welling up from behind the pubes, but the site of the injury was so inaccessible that no attempt was made to apply sutures. There still remained the difficulty of accounting for the blood-stained fluid in the abdominal cavity so, once more, the viscera were systematically explored and at length a cyst was discovered lying retroperitoneally behind and rather to the outer side of the ascending colon, reaching from the cæcum below to the front of the right kidney above. This was enucleated by an incision through the peritoneum to the outer side of the large intestine and was found to be oval in shape, six inches long and three in diameter, with very thin gauzy looking walls and containing a clear limpid fluid. No further abnormality could be made out and the abdominal cavity was flushed with sterile salt solution and the wall closed except at its lower angle, where gauze drainage of the prevesical space was established. A flexible catheter was passed per urethram into the bladder and the patient sent back to bed.

Her subsequent history is that the blood-stained urine soon became clear, while the retropubic urinary fistula gradually closed, convalescence being retarded by the occurrence of some suppuration in the left labium and adjacent adductor region. She left the Hospital on the 18th July, 1904, quite well. Histological examination of the cyst proved it to be a hydatid. The patient was at first too ill to have a skiagram of the pelvic bones taken to show the site of the fracture and unfortunately this was omitted before her dismissal.

As in the other case, both an extraperitoneal and intraperitoneal injury occurred as the result of the fall. What the intraperitoneal lesion was is obscure, but a reasonable hypothesis seems to be that there existed in the abdomen another cyst similar to the one discovered, but which had ruptured at the time of the accident, the contained fluid escaping into the peritoneal cavity and setting up irritation with effusion. Assuming that the wall of the ruptured cyst was of the same thin, gauzy nature as the other, it cannot be wondered at that, when collapsed, it escaped detection. The combination of fractures of the pelvis in this case with extraperitoneal rupture of the bladder and the absence of fracture in the intraperitoneal case is in conformity with the general rule.